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(71) Applicant: SONY CORPORATION
7-35 Kitashinagawa 6-Chome Shinagawa-ku
Tokyo 141(JP)

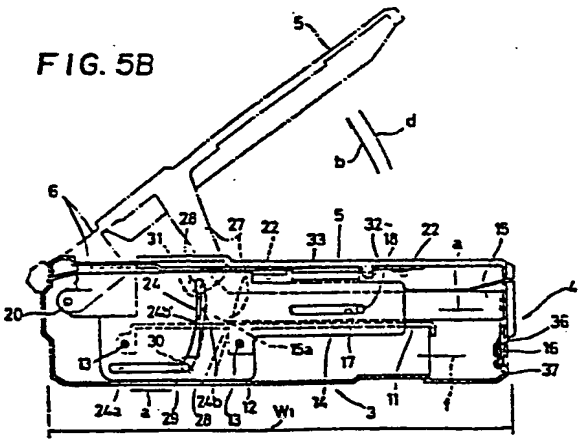
(72) Inventor: Murakami, Atsushi c/o Sony Corporation
Patents Division 7-35, Kitashinagawa 6-chome
Shinagawa-ku Tokyo(JP)

(74) Representative: Purvis, William Michael Cameron et al,
D. Young & Co. 10 Staple Inn
London WC1V 7RD(GB)

(54) Cassette tape recording and/or reproducing apparatus.

(57) The body of a cassette tape recording and/or reproducing apparatus, in which a cassette can be mounted so that a tape therein is driven for recording and/or reproducing, comprises a primary portion (3) and a secondary portion (4) slidably combined therewith and a portion (5) of an openable and closable cover (5, 6) which covers the cassette mounted in the body (3, 4) is also slidable with the secondary portion of the body. When the apparatus is out of use, the widths of the body (3, 4) and cover (5, 6) can be decreased to smaller widths than those necessitated for mounting the cassette. The cover (5, 6) is prevented from opening in the reduced width configuration, but can be opened after the widths of the body and cover have been increased to the widths necessary for mounting the cassette. The widths cannot be reduced while the cover is open.

FIG. 5B



EP 0 163 549 A1

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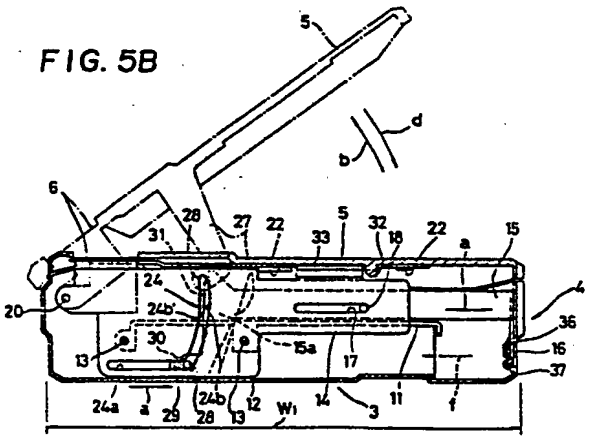
(54) Cassette tape recording and/or reproducing apparatus.

(57) A handling machine for deposit envelopes (E) includes a delivery device (2) for carrying the inserted deposit envelopes (E) along a delivery path, a printer (4) for printing deposit information to one sides of labels, a label feed device (3) for supplying on a given place of the delivery path the labels having the deposite information printed to one sides and adhesives applied on the other side, and members (5, 8) for sandwiching under pressure therebetween the labels fed onto the delivery path and the deposit envelopes (E) carried to stick the labels to the deposit envelopes (E).

FIG. 5B



CASSETTE TAPE RECORDING AND/OR REPRODUCING APPARATUS

The invention relates to cassette tape recording and/or reproducing apparatus, best suited for a compact tape cassette, and particularly to such cassette tape recording and/or reproducing apparatus, wherein not only a body in which a tape cassette is mounted, but also an openable cover which covers the tape cassette mounted in the body, can be varied together in width, and when the apparatus is in use, the widths of the body and cover are increased to minimal widths necessitated for mounting a cassette, whereas when the apparatus is out of use, the widths of the body and cover are decreased to smaller widths than those necessitated for mounting the cassette so as to be easier to carry.

In a cassette tape recording and/or reproducing apparatus of this kind, if the widths of the body and cover can be increased or decreased independently to each other, erroneous operations such as mounting the tape cassette while the width of the body is decreased, or decrease the width of the body while the tape cassette is mounted can occur resulting in the tape cassette or the apparatus being considerably damaged.

According to the invention there is provided a cassette tape recording and/or reproducing apparatus comprising:

(a) a primary portion of a body in which a tape drive mechanism is housed;

(b) a secondary portion of said body moved slidably against said primary portion between a first position where a cassette cannot be mounted and a second position where a cassette can be mounted;

(c) cover supporting means moved swingably against the primary portion of the body; and

(d) a cover moved slidably against the cover supporting means and covering the cassette which is mounted in the primary portion and the secondary portion of the body; characterised by

(e) guide means disposed in the primary portion of the body and having a first guide part parallel to the sliding direction of the secondary portion and a second guide part formed almost circularly round the fulcrum of the cover supporting means as a centre in succession to the first guide part;

(f) first engagement means so disposed on the cover through a support member so as to be engaged with the guide means and be movable from the first guide part to the second guide part or in reverse as it follows the movement of the cover; and

(g) second engagement means by which the cover is slidably moved, following the movement of the secondary portion of the body,

(h) the secondary portion of the body and the cover being so moved slidingly together by the second engagement means as to move the first engagement means along the first guide part of the guide means when the secondary portion is moved against the primary portion of the body, so that the cover is kept in its closed state, and

(i) the first engagement means being movable along the second guide part of the guide means, only when the secondary portion of the body is in the second position, so that the cover is openable and closable with rotation of the cover supporting means.

The invention is diagrammatically illustrated by way of example with reference to the accompanying drawings, in which:-

Figures 1 to 3 are perspective views used for explaining the manner of handling a cassette tape recording and/or reproducing apparatus according to the invention;

Figure 4 is a front view of cassette tape recording and/or reproducing apparatus according to the invention;

Figures 5A and 5B are sectional views taken on line V - V of Figure 4;

Figures 6A and 6B are sectional views taken on line VI - VI of Figure 4;

Figure 7 is an enlarged sectional view taken on line VII - VII of Figure 5A;

Figure 8 is an enlarged sectional view taken on line VIII - VIII of Figure 5A; and

Figure 9 is an enlarged sectional view taken on line IX - IX of Figure 4.

Referring to the drawings, and initially to Figures 1 to 3, a tape cassette 1 is mounted in a body 2 of a cassette tape recorder, which body 2 comprises a primary portion 3 and a secondary portion 4 which are slidably combined with each other so that the width of the body may be increased or decreased as desired.

A cover 5 which covers the tape cassette 1 and is pivotably mounted on the body 2, is combined with the primary portion 3 of the body 2 through a support member 6 and can be varied in width. On the inside of the cover 5, there is arranged a cassette holder 7 which is also combined pivotably with the primary portion 3 of the body 2 together with the support member 6.

In Figure 3 which shows the cassette tape recorder in use, the widths of both body 2 and cover 5 have been increased to width W_1; a minimal width necessitated for mounting the cassette 1, and in Figure 1 which shows the cassette tape recorder out of use, the widths of both the body 2 and the cover 5 have been decreased to width W_2; a smaller width than that necessitated for mounting the cassette 1.

When the recorder is to be used, the secondary portion 4 of the body 2 is slid in the direction of arrow a with respect to the primary portion 3 of the body 2 as indicated in chain-dotted lines in Figure 1, so that the width of the body 2 is increased from width W_2 to width W_1. As this happens, the cover 5 is also slid in the direction of arrow a together with the secondary portion 4 of the body 2 as kept in the closed state.

When a unlocking button 8 provided at a side of the secondary portion 4 of the body 2 is pushed, the cover 5 pops up in the direction of arrow b to the position indicated in chain-dotted lines in Figure 2. In succession, if the cover 5 is swung in the direction of arrow b with the finger, the cover 5 is opened as indicated in solid lines in Figure 2. As this happens, the cassette holder 7 follows the cover 5 and is also swung in the direction of arrow b. The pop-up action of the cover 5 is performed through a spring (not shown) sandwiched between the cover 5 and the cassette holder 7, and the cover 5 is kept in the opened position by means of a toggle mechanism.

As shown in Figure 2, the cassette 1 is inserted in the direction of arrow c from above into the cassette holder 7 which is arranged on the inside of the cover 5.

Next, when the cover 5 is swung to the closed position in the direction of arrow d, Figure 3, with the finger, the cassette 1 and cassette holder 7 are also swung in the same direction, so that the cassette 1 is mounted horizontally in a cassette mounting position of the body 2 as indicated in dotted lines in Figure 3.

The cassette tape recorder has a pair of right and left reel bases 9 shown in Figure 2 and a capstan (not shown), within the cassette mounting position of the body 2 like the conventional cassette tape recorder, so that the cassette 1 horizontally mounted is engaged with the pair of reel bases 9 and the capstan, and the closed cover 5 is locked with a locking click mentioned later.

The above described cassette tape recorder is used for reproducing only, so that a playback head, a pinch roller, etc. (not shown) are provided in the cassette holder 7, and the playback head and pinch roller are inserted shallowly into the cassette 1 when the cassette 1 is inserted into the cassette holder 7 as shown in Figure 2. When a playback button is pushed after the cassette 1 has been inserted and the cover 5 closed, the playback head and pinch roller are deeply inserted into the cassette 1, so that the playback head comes in contact under a predetermined pressure with the magnetic tape (not shown) within the cassette 1, and the pinch roller is pressed against the capstan so as to perform a desired reproduction on the cassette 1.

Next, the construction of the cassette tape recorder will be described in detail with reference to Figures 4 to 9.

The primary portion 3 of the body 2 comprises a main chassis 11, a primary case 12 secured to the periphery of the main chassis 11 with screws and a guide plate 14 which is secured vertically to one side of the main chassis 11 with screws 13 within the primary case 12 as illustrated in Figures 5 and 7.

The secondary portion 4 of the body 2 comprises a slidable chassis 15 combined slidably with the main chassis 11 and a secondary case 16 secured to the periphery of the slidable chassis 15 with screws. In order to make the drawings simple, there is illustrated a constitution that a guide pin 18 secured to the slidable chassis 15 is guided by a elongate slot 17 provided in the guide plate 14 as shown in Figures 5 and 8.

As shown in Figure 5, the support member 6 is mounted rotatably to the guide plate 14 and the main chassis 11 on a pair of right and left pivots 20, and also the cassette holder 7 is mounted on these pivots 20. Further, the cover 5 is attached to the support member 6 by elongate slots 21 and guide pins 22, and slidable against the support member 6 as shown in Figures 5, 6 and 8.

In the guide plate 14, there is provided an L-shaped guide groove 24 having a linear part 24a parallel to the sliding direction of the slidable chassis 15 and a part 24b circularly curved about the pivot 20 as centre, as shown in Figures 5 and 7. A support member 27 secured at its upper end to the cover 5 with screws 26 projects along the inside of the guide plate 14, and a sliding block 28 attached to the lower end of the support member 27 is slidably fitted in the guide groove 24.

Further, a guide piece 15a which extends almost vertically from one end of the slidable chassis 15 is inserted between the guide plate 14 and the support member 27, and a sliding block 29 secured to the lower end of the guide piece 15a is slidably fitted in the guide groove 24 in a position between the pivot 20 and the sliding block 28. The sliding block 29 protrudes from a small projection 30 formed integrally with the guide piece 15a.

As shown in Figure 6, the guide piece 15a has a circularly curved edge 31 which is exactly the same in configuration as the curved part 24a of the guide groove 24, and the sliding block 28 is sandwiched between the curved edge 31 and the small projection 30. The contact surface of the sliding block 28 with the curved edge 31 is the rear part of the sliding block 28 with respect to the pivot 20.

Next, the width changing movements of the body 2 and cover 5, and the opening and closing movement of the cover 5 will be described.

When the widths of the body 2 and cover 5 are decreased to width W_2 as indicated in solid lines in Figure 1, the sliding blocks 28 and 29 are located at one end of the linear part 24a of the guide groove 24 as shown in Figures 5A and 6A. Therefore, the cover 5 cannot be swung in direction of arrow b in Figure 5A, because the cover 5 is held in the closed state by the linear part 24a of the guide groove 24. In addition, a pawl 32 formed integrally with the cover 5 at a position spaced from the pivot 20 engages in a guide groove 33 which is formed integrally with the guide plate 14 in a position near to its upper edge, as shown in Figures 5 and 8, and the pawl 32 and the guide groove 33 prevent the cover 5 from opening, even if force is applied to open the cover 5 in direction of arrow b in Figure 5A.

As indicated in chain-dotted lines in Figure 1, if the secondary portion 4 of the body 2 and the cover 5 are slid together in the direction of arrow a, so that the widths of the body 2 and the cover 5 are increased to

width W_1, the slidable chassis 15 is also slid in the direction of arrow a to the position indicated in solid lines in Figures 5B and 6B, and after the sliding blocks 28 and 29 slide along the linear part 24a of the guide groove 24 in the direction of arrow a, the sliding block 28 enters the curved part 24b of the guide groove 24. At this time, a plurality of engagement grooves 34 formed at the front end of the closed cover 5 are engaged respectively with a plurality of projections 35 formed at the front end of the secondary case 12 of the body 2 as shown in Figures 4 and 9, so that the secondary portion 4 of the body 2 and the cover 5 are slid surely together and transmit forces to each other.

The cover 5 is kept in the closed state while the sliding block 28 is slid along the linear part 24a of the guide groove 24, and released from this closed state, only when the secondary portion 4 of the body 2 reaches a position where its sliding movement is finished and the sliding block 28 enters the curved part 24b of the guide groove 24 as indicated in solid lines in Figures 5B and 6B. Further, at this time, the pawl 32 of the cover 5 is disengaged from the guide groove 33.

Next, when an unlocking button 8 is pushed in the direction of arrow e as shown in Figure 4, a sliding plate 36 integral with the unlocking button 8 is slid in the direction of arrow e against the force of a spring 37, and a pawl 38 provided at the distal end of and formed integrally with the sliding plate 36 is disengaged from a pawl 39 provided at the front end of the cover 5 as indicated in chain-dotted lines in Figure 4, so that the cover 5 is unlocked.

Hence, the cover 5 can be swung open in the direction of arrow b on the pivot 20 together with the support member 6, but the slidable chassis 15 cannot be slid in the direction of arrow f, because the sliding block 28 which has entered the curved part 24b of the guide groove 24 as the cover 5 opens, is sandwiched between the curved edge 31 of the slidable chassis 15 and a curved edge 24b' of the curved part 24b of the guide groove, the curved edge 24b' being the one nearer to the pivot 20 of the two side edges of the curved part 24b.

Accordingly, when the cover 5 is being opened, or is opened as indicated in chain-dotted lines in Figures 5B and 6B, it is absolutely impossible to slide the secondary portion 4 of the body 2 in the direction of arrow f to decrease the width of the body 2 to the width W_2 as indicated in solid lines in Figure 1.

Thus, in summary, the cover 5 is slid together with the secondary portion 4 of the body 2 under the closed state, and can be opened only when the secondary portion 4 of the body 2 is moved to the position indicated in solid lines in Figures 5B and 6B so that the width of the body 2 may be increased to width W_1.

The width of the body 2 cannot be decreased to width W_2 while the cover 5 is being opened, or is in the opened position indicated in chain-dotted lines in Figures 5B and 6B, and can be slid in the direction of arrow f together with the secondary portion 4 of the body 2, so as to decrease the width of the body 2 to the width W_1, only when the cover 5 is closed as indicated in solid lines in Figures 5B and 6B.

Various modifications are possible within the scope of the appended claims, for example, the cassette tape recorder may be such that the cassette holder 7 is not used and the playback head and pinch roller are disposed on a head base plate attached slidably to the main chassis 11.

Although, as described, the guide groove 24 and the curved edge 31 are disposed in the guide plate 14 and the slidable chassis 15, respectively, the guide groove 24 and curved edge 31 could be disposed in the primary case 12 and the secondary case 16, respectively. Further, the curved edge 31 may be a curved groove which is the same in shape as the curved part 24b of the guide groove 24.

The invention may be applied not only to a cassette tape recorder for a compact cassette, used only for reproducing but also to various other kinds of cassette tape recording and/or reproducing apparatus for various kinds of cassette, used for recording and/or reproducing.

CLAIMS

1. A cassette tape recording and/or reproducing apparatus comprising:

(a) a primary portion (3) of a body (2) in which a tape drive mechanism is housed;

(b) a secondary portion (4) of said body (2) moved slidably against said primary portion (3) between a first position where a cassette cannot be mounted and a second position where a cassette can be mounted;

(c) cover supporting means (6) moved swingably against the primary portion (3) of the body (2); and

(d) a cover (5) moved slidably against the cover supporting means (6) and covering the cassette which is mounted in the primary portion (3) and the secondary portion (4) of the body (2); characterised by

(e) guide means (24) disposed in the primary portion (3) of the body (2) and having a first guide part (24a) parallel to the sliding direction of the secondary portion (4) and a second guide part (24b) formed almost circularly round the fulcrum of the cover supporting means (6) as a centre in succession to the first guide part (24a);

(f) first engagement means (28) so disposed on the cover (5) through a support member (27) so as to be engaged with the guide means (24) and be movable from the first guide part (24a) to the second guide part (24b) or in reverse as it follows the movement of the cover (5); and

(g) second engagement means (30) by which the cover (5) is slidably moved, following the movement of the secondary portion (4) of the body (2),

(h) the secondary portion (4) of the body (2) and the cover (5) being so moved slidingly together by the second engagement means (30) as to move the first engagement means (28) along the first guide part (24a) of the guide means (24) when the secondary portion (4) is moved against the primary portion (3) of the body (2), so that the cover (5) is kept in its closed state, and

(i) the first engagement means (28) being movable along the second guide part (24b) of the guide means (24), only when the secondary portion (4) of the body (2) is in the second position, so that the cover (5) is openable and closable with rotation of the cover supporting means (6).

2. A cassette tape recording and/or reproducing apparatus according to claim 1; in which an abutting means (31) slidable with the secondary portion (4) of the body (2) abuts against the first engagement means (28) when the first engagement means (28) is in the second guide part (24b) of the guide means (24), so that the secondary portion (4) cannot be moved from the second position to the first position.

3. A cassette tape recording and/or reproducing apparatus according to claim 2; in which the abutting means (31) is almost the same in configuration as the second guide part (24b) of the guide means (24) formed circularly, and is placed on a side of the first engagement means (28) opposite to that facing the fulcrum of the cover supporting means (6).

4. A cassette tape recording and/or reproducing apparatus according to claim 1 or claim 2, in which the second engagement means (30) is so formed integrally with the abutting means (31) as to be able to move the first engagement means (28), as the secondary portion (4) of the body (2) moves between the first position and the second position.

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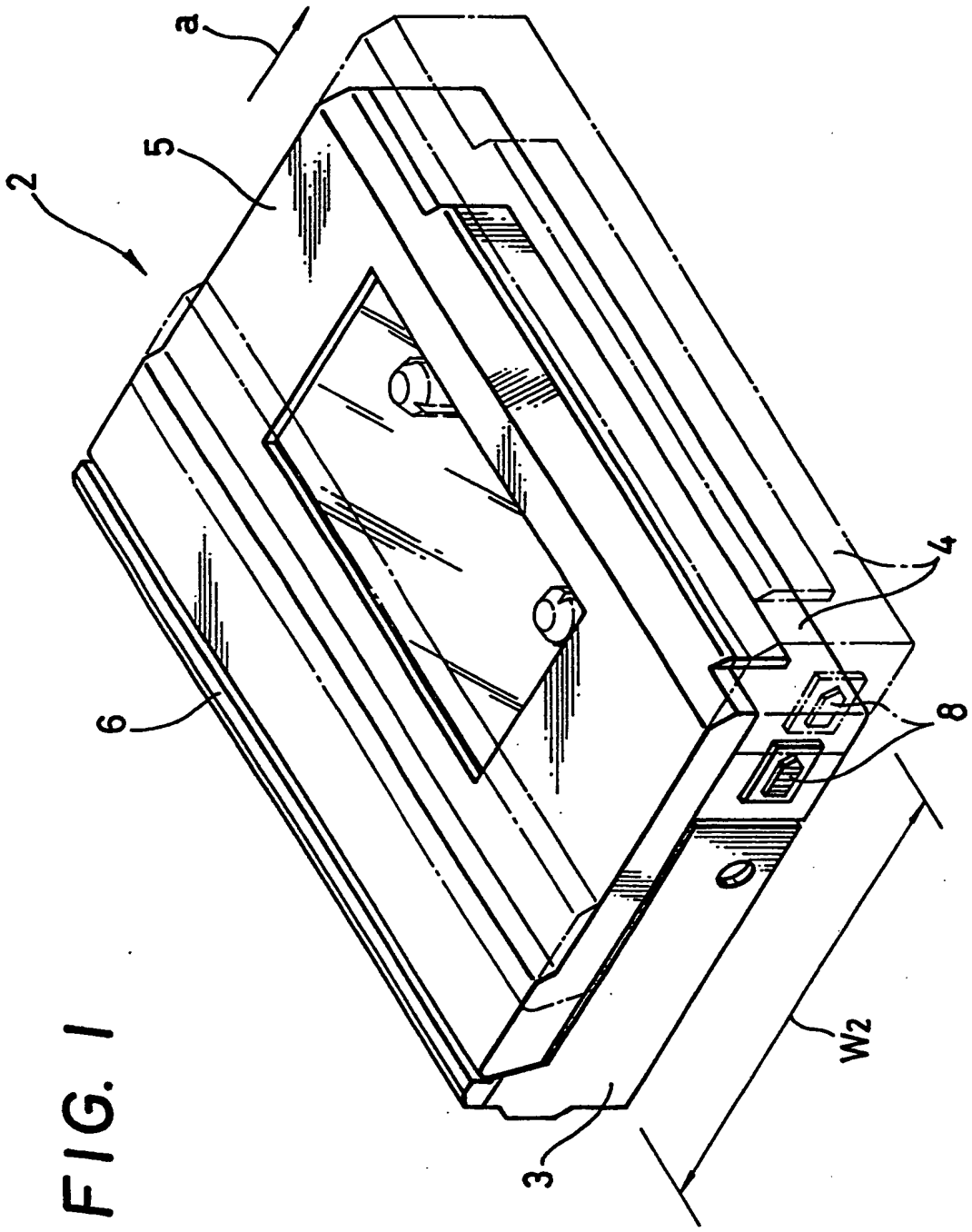

FIG. 1

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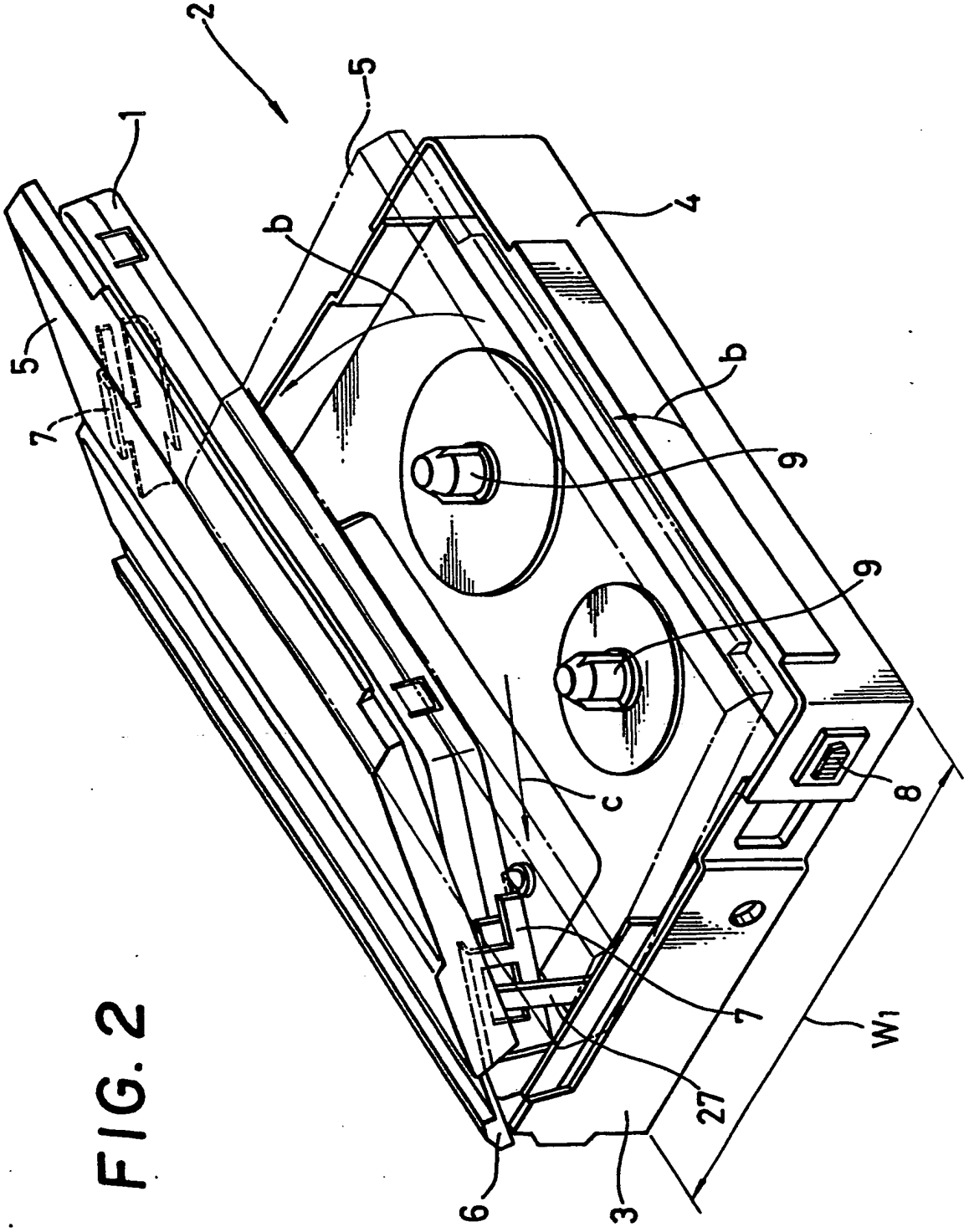

FIG. 2

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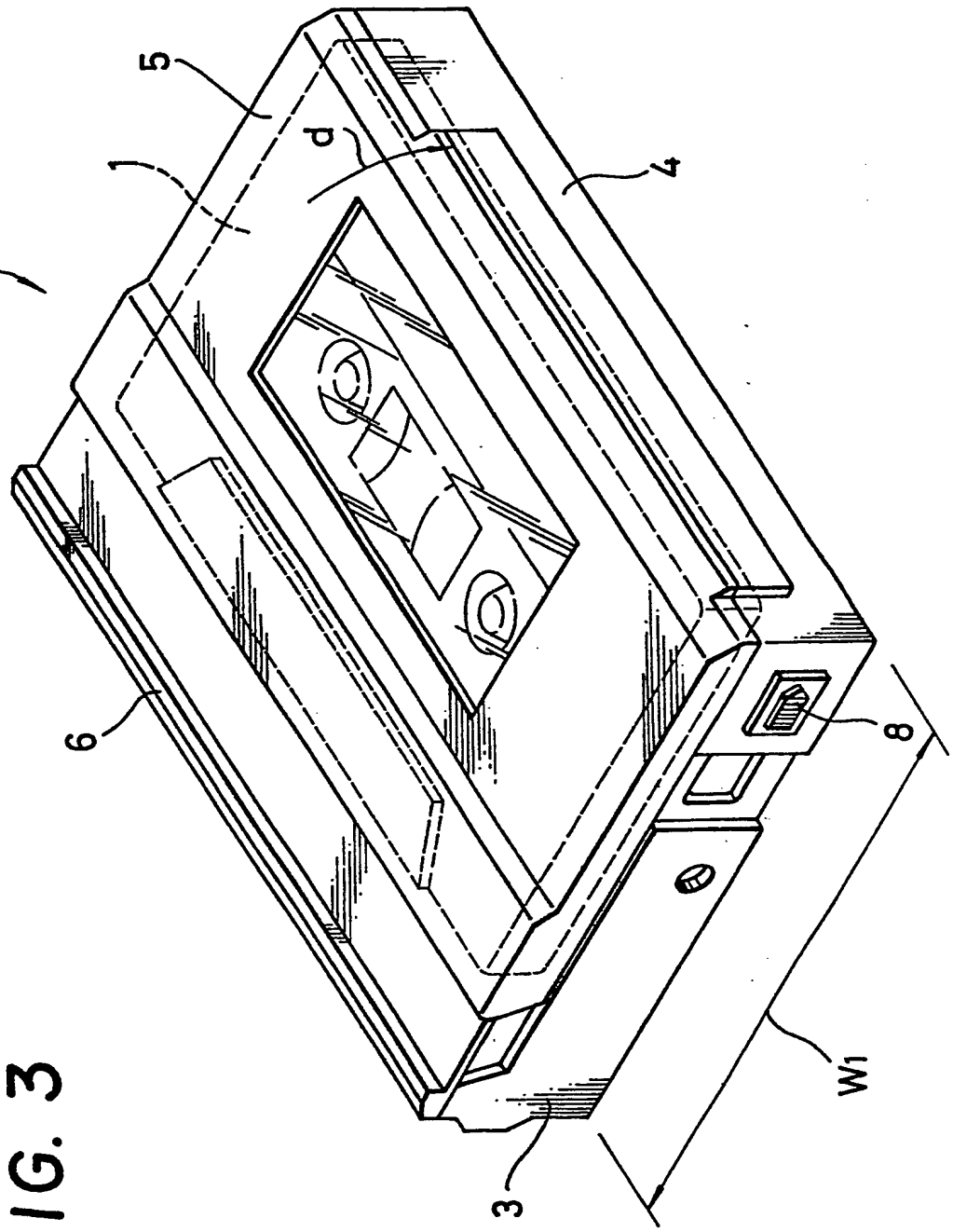


FIG. 3

FIG. 4

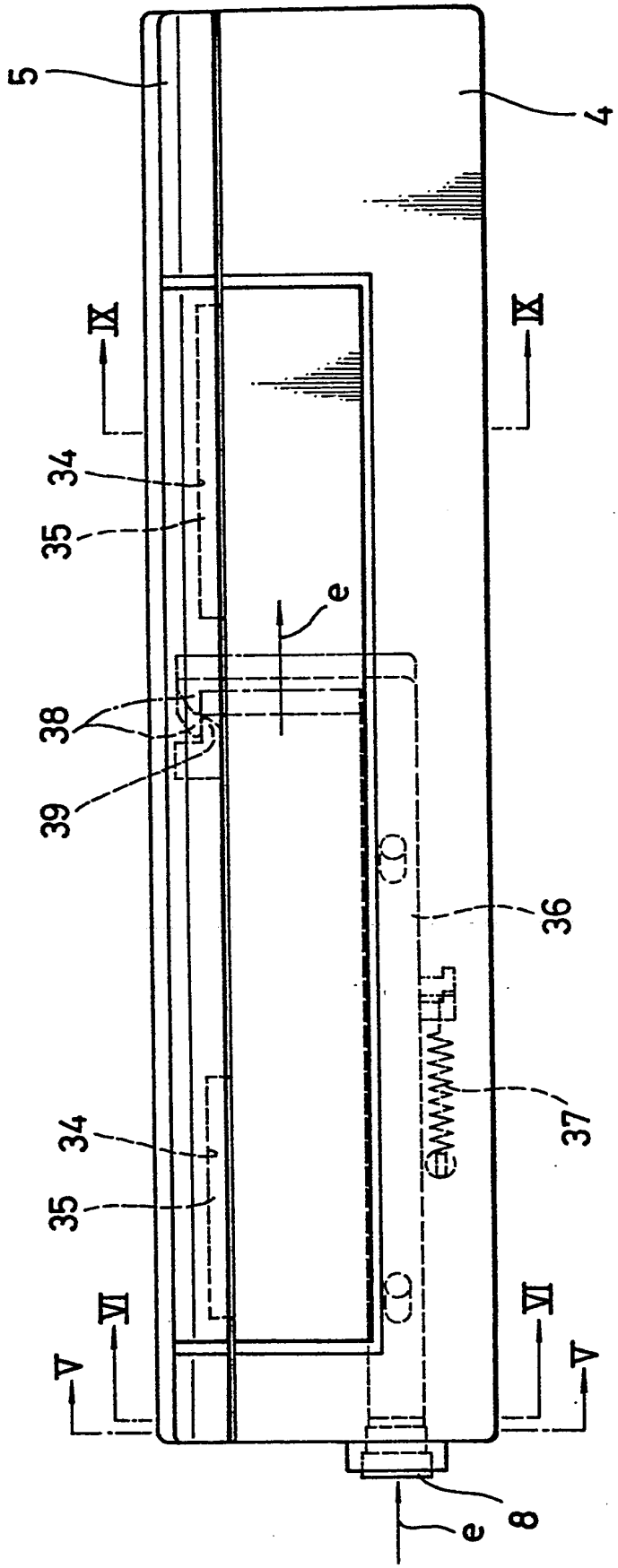
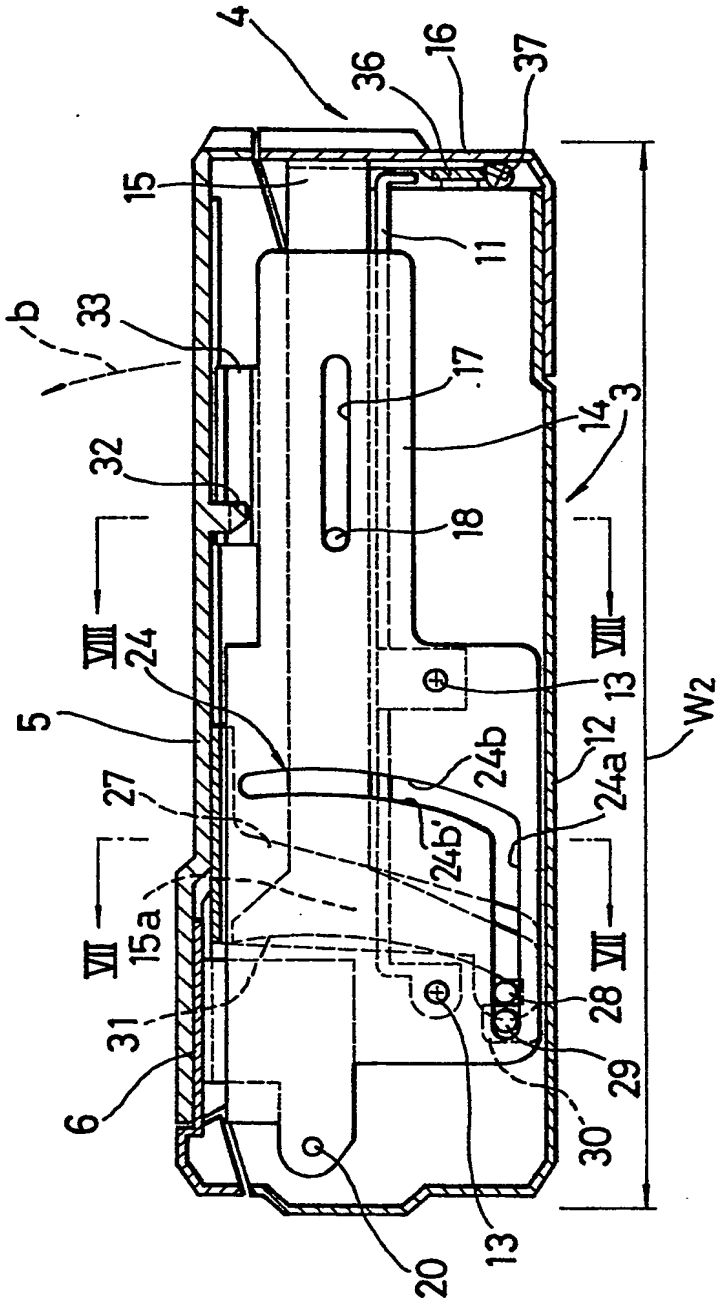


FIG. 5A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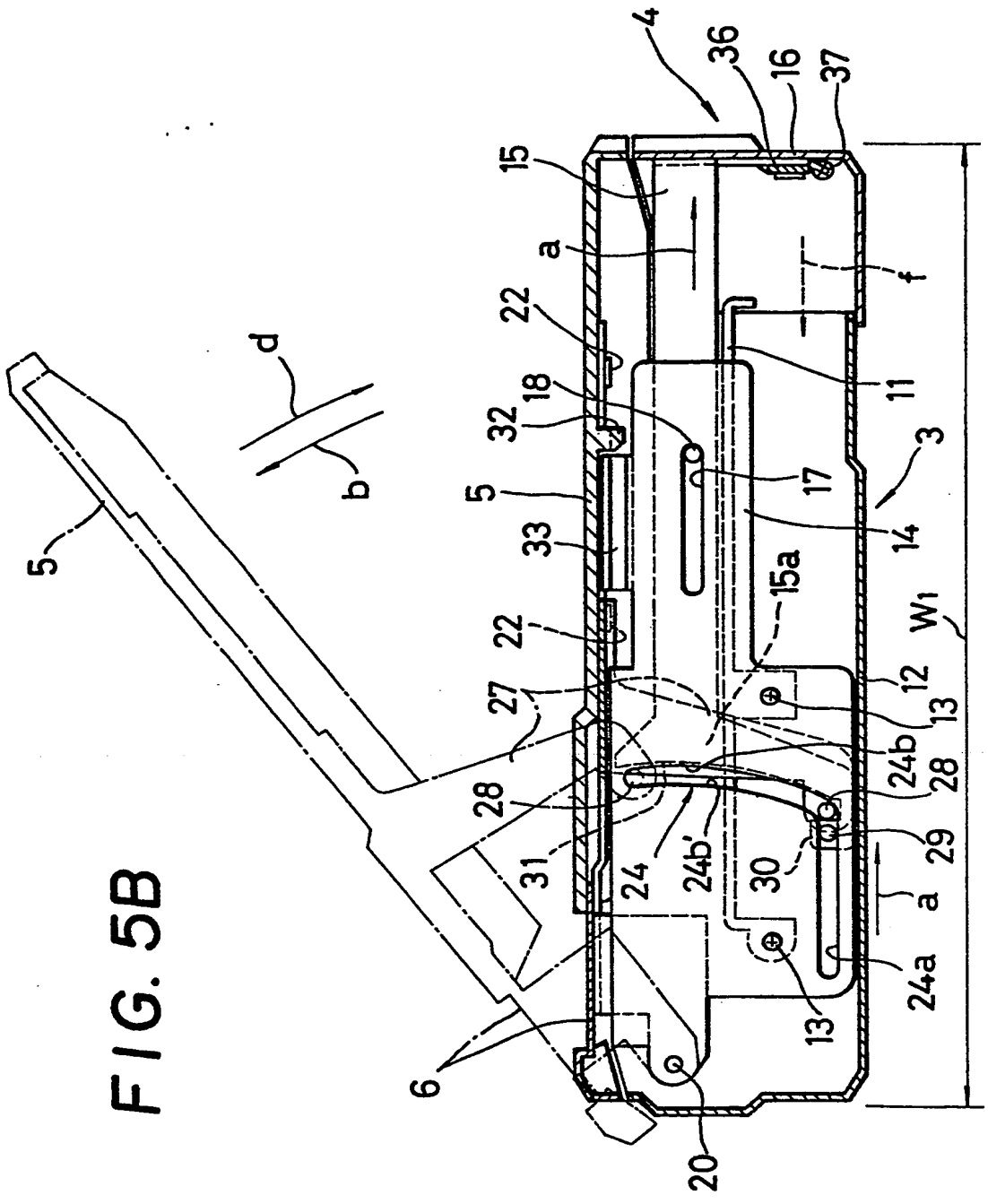
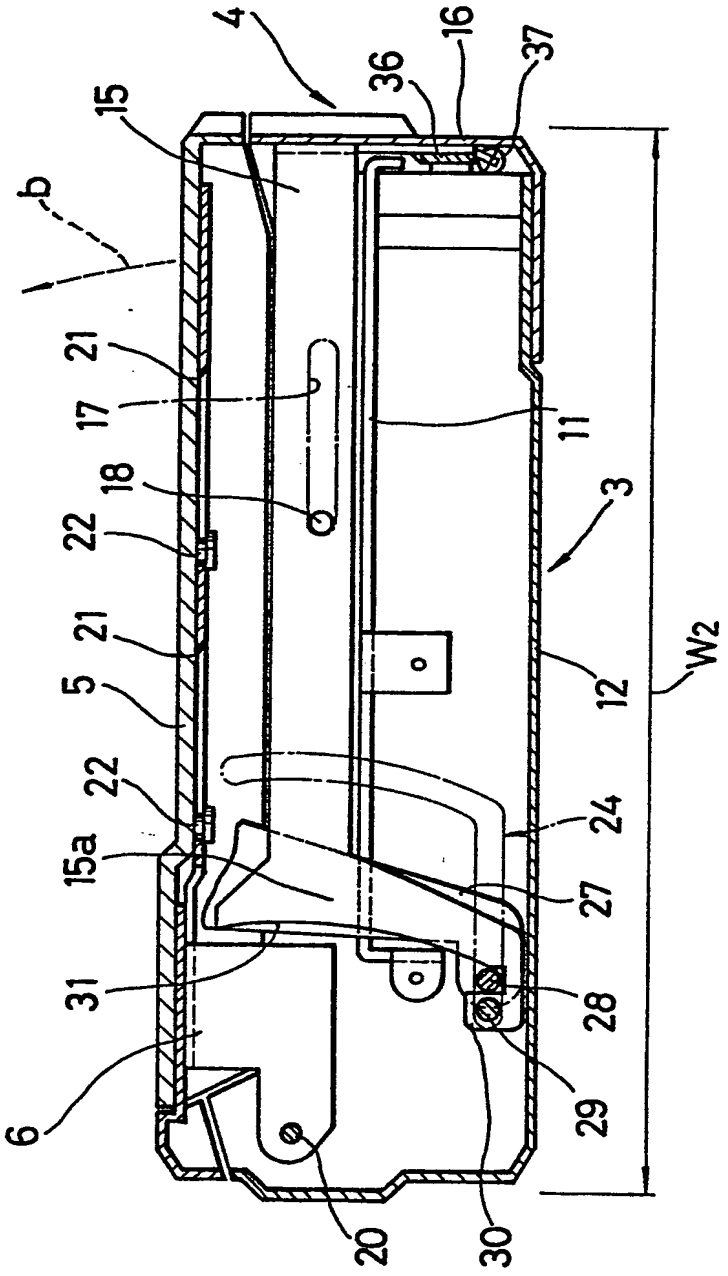


FIG. 5B

FIG. 6A



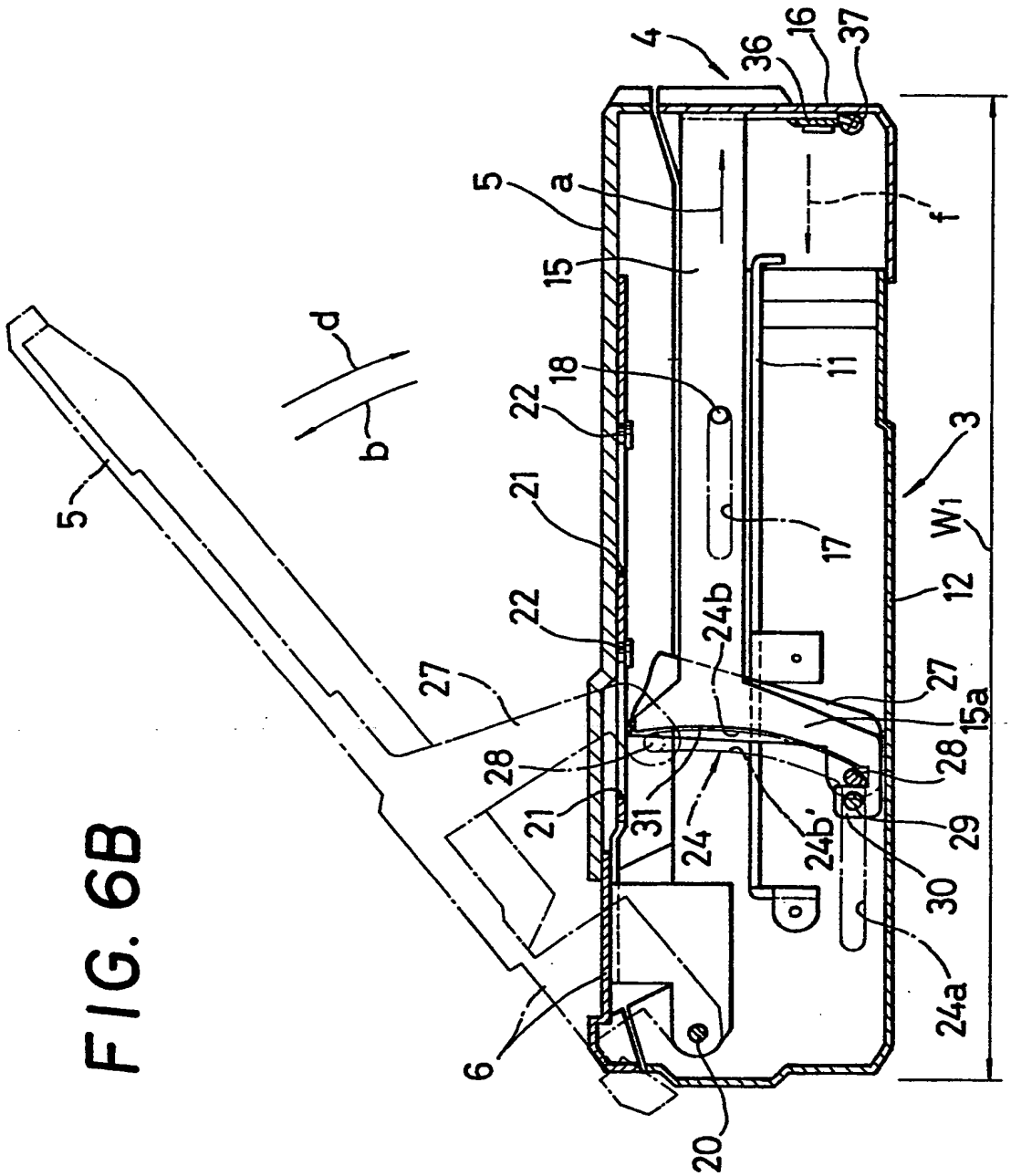


FIG. 6B

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FIG. 9

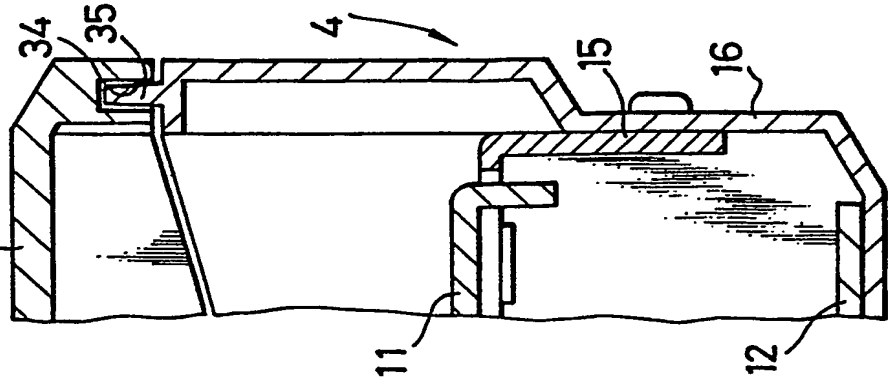


FIG. 8

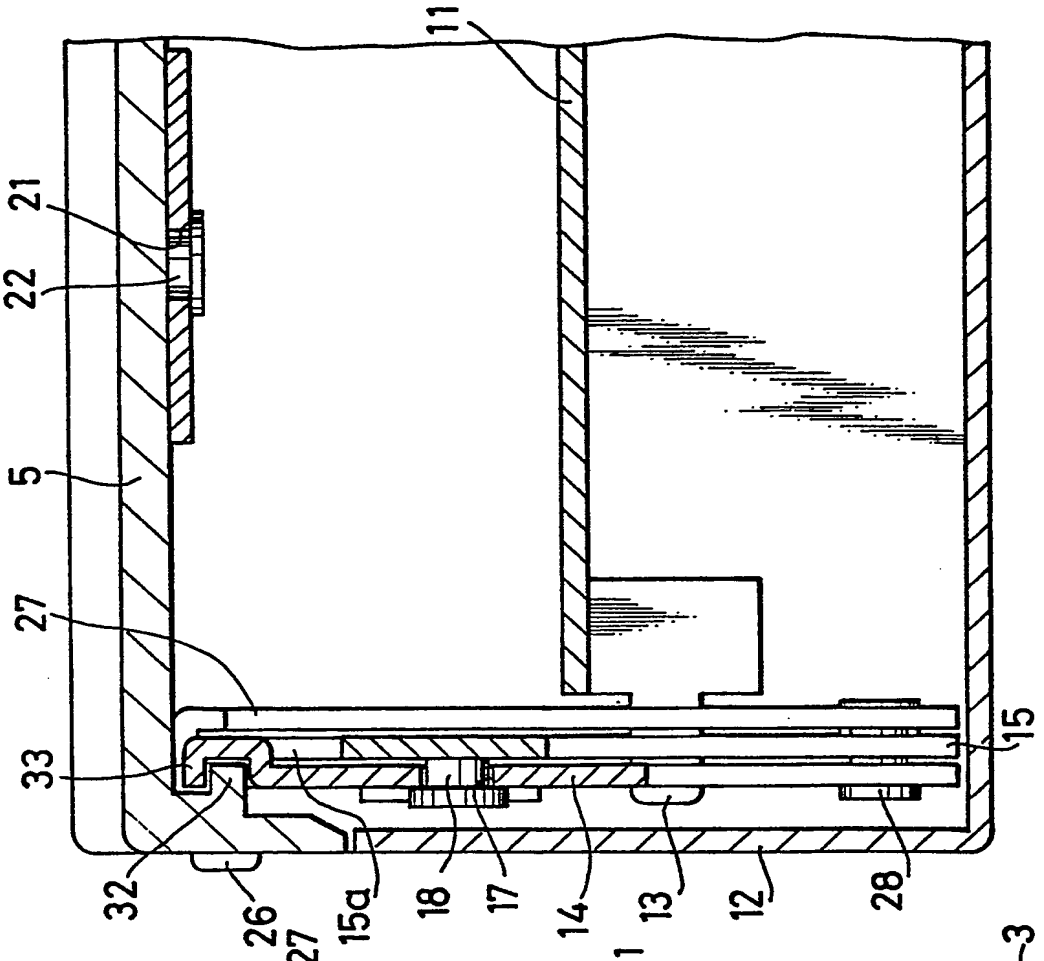
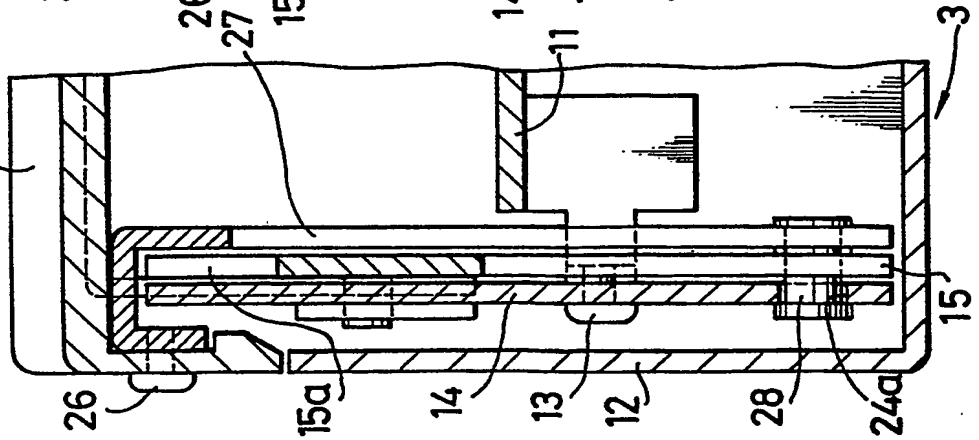


FIG. 7



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EUROPEAN SEARCH REPORT

0163549
Application number

DOCUMENTS CONSIDERED TO BE RELEVANT

EP 85303872.7

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	DE - B - 2 152 414 (OLYMPIA) * Fig. 1,2; claims 1-5 * --	1	G 11 B 33/02
A	DE - A1 - 3 327 599 (VICTOR) * Fig. 1-19; abstract * --	1	
A	FR - A1 - 2 492 148 (MITSUBISHI) * Fig. 2-16; claims 1-27 * --	1	
A	FR - A1 - 2 306 500 (MOTOROLA) * Fig. 1,2a; claim 1 * --	1	
A	DE - A1 - 3 151 715 (SONY) * Fig. 1-7; abstract * ----	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

G 11 B 1/00
G 11 B 25/00
H 05 K 5/00
G 11 B 5/00

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	23-08-1985	BERGER

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
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P : intermediate document

T : theory or principle underlying the invention
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